

**Notice of Allowability**

Application No.

09/975,256

Examiner

David L. Hogans

Applicant(s)

RAMKUMAR ET AL.

Art Unit

2813

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment filed April 14, 2004.
2. ☒ The allowed claim(s) is/are 1,2,5 and 7-23.
3. ☒ The drawings filed on 12 October 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other

  
**CARL WHITEHEAD, JR.**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**

### **DETAILED ACTION**

This Office Action is in response to the Amendment filed on April 14, 2004.

#### ***Status of Claims***

Claims 1, 2, 5 and 7-23 are pending. Claims 3, 4 and 6 are cancelled.

#### ***Claim Rejections - 35 USC § 112***

The rejection of Claim 3 via 35 U.S.C. 112, first paragraph, has been withdrawn pursuant to Applicant's Remarks submitted on April 14, 2004.

### **EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Michael Ye on May 25, 2004.

The application has been amended as follows:

Claim 5 line 1: delete "4" and insert "1"

Claim 19 line 7: after "formation" insert "in a chemical vapor deposition furnace."

#### ***Allowable Subject Matter***

2. Claims 1, 2, 5 and 7-23 are allowed.
3. The following is an examiner's statement of reasons for allowance.

The prior art of record, in combination with other claimed features, fails to explicitly teach wherein an oxide/gate oxide layer is thermally oxidized in a chemical vapor deposition furnace and then nitrided by NO gas at 800 °C or less and 1 atm or less. For instance, 6,479,349 to Oya et al. nitrides an oxide layer but does not nitride the oxide/gate oxide layer that is formed by thermal oxidation in a chemical vapor deposition furnace. Finally, Applicant's 37 C.F.R. 132 affidavit submitted on April 14, 2004, provides evidence denoting the advantages of a thermally grown oxide layer as opposed to a CVD oxide layer.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,245,616 to Buchanan et al. teaches forming an oxynitride gate dielectric by reacting a silicon substrate with NO gas but does not teach forming an oxide by thermal oxidation in a chemical vapor deposition furnace and then nitriding the oxide layer by exposing the oxide layer to NO gas at 800 °C or less and 1 atm or less.

US 2002/0017677 to Kai et al. teaches forming a thermal oxide layer, under a CVD oxide layer, wherein the CVD oxide layer is exposed to NO gas. Kai et al. fails to explicitly teach that the thermal oxide layer is nitrided under the proposed conditions.

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Finally, Kai et al. teaches that NO oxidizing gas atmospheres, at temperatures of 800 °C, do not produce desirable leak current effects and that temperature of 900 °C or more are desirable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Hogans whose telephone number is (571) 272-1691. The examiner can normally be reached on M-F (7:30-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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